REMARKS

The Office Action issued August 23, 2002 has been reviewed and the comments of the U.S. Patent and Trademark Office have been considered. Claims 15-17 have been canceled without prejudice or disclaimer. Claim 10 has been amended. New claim 18 has been added. Accordingly, Applicant requests reconsideration of the pending claims 1-14 and 18.

Applicant thanks the Examiner for indicating that claims 10-14 would be allowable if rewritten into independent form. Claim 10 has been rewritten into independent form as suggested by the Examiner. Accordingly, claims 10-14 are in condition for allowance.

The drawings have been objected to as failing to illustrate features of various sensors and a method as described and recited in the specification. Applicant proposes by the accompanying letter entitled "Proposed Drawing Change" to modify Figure 2 to provide for sensors coupled to the schematic at flux 190 and identified as a Hall effect sensor 10, GMR sensor 20 or eddy-current sensor 30. Support for the proposed drawing modifications is provided in the originally filed specification at, for example, page 6, paragraph 0026. Further, Applicant respectfully notes that the method as recited in claim 13 does not admit of illustration under 37 C.F.R. §§1.81(c) or 1.83(c) because one of the features of "subtracting voltage across a coil..." as identified by the Examiner in claim 13 is a feature which does not lend itself to illustration by a drawing. Accordingly, Applicant respectfully requests withdrawal of this requirement. However, upon consideration of the above reason, should the Examiner still require an illustration, Applicant could provide a flow chart with boxes stating the claimed features of the method.

Claims 1, 2, and 15-17 stand rejected under 35 U.S.C. §102 as being anticipated by U.S. Patent No. 4,585,978 to Hasselmark *et al* ("Hasselmark"). Claims 3-5 and 7 stand rejected under 35 U.S.C. §103 as being unpatentable over Hasselmark in view of U.S. Patent No. 6,176,207 to Wright *et al* ("Wright"), which was filed on February 19, 1998 and patented on January 23, 2001. Claim 6 stands rejected under 35 U.S.C. §103 as being unpatentable over Hasselmark in view of Wright and further in view of U.S. Patent No. 6,152,372 to Colley *et al* ("Colley"). Claims 8 and

9 stand rejected under 35 U.S.C. §102 as being anticipated by Hasselmark in view of Japanese reference JP4-4776.

Applicant respectfully traverses this rejection because Hasselmark fails to teach or suggest the claimed invention as a whole as recited in claim 1.

Claim 1 recites a method of controlling a magnetostrictive actuator that can be achieved, in part, by measuring the amount of magnetic flux generated in a coil and applying the amount of magnetic flux as a feedback variable to selectively control the amount of magnetizing force being applied to a magnetostrictive member.

In contrast, Hasselmark relies on: (1) **magnetic flux density** rather than magnetic flux, (2) the magnetic flux density is sensed from a magnetostrictive rod rather than a measurement of the magnetic flux from a coil, and (3) the magnetic flux density of the magnetostrictive rod is used to sense displacement of the rod rather than a measurement of magnetic flux to control a magnetizing force. In particular, Hasselmark states, at column 2, lines 66-68 that **magnetic flux density** is used for displacement control instead of magnetic flux. Further, Hasselmark states, at column 4, lines 44-49, that the magnetic flux density is measured within the magnetostrictive rod 52 instead of a measurement of the magnetic flux generated in the coil. Thus, Hasselmark relies on sensed magnetic flux density of the magnetostrictive rod 52 to determine magnetostrictive rod's displacement, and fails to teach or suggest measuring magnetic flux in a coil and applying a value of the measured magnetic flux to control the magnetizing force being applied to a magnetostrictive member, as recited in claim 1. Accordingly, claim 1 is patentable because Hasselmark fails to teach or suggest features of the claimed invention as a whole.

Notwithstanding the deficiencies in Hasselmark, the Office Action asserts that the method of claims 3-5, and 7, respectively, is rendered obvious based on Hasselmark in view of the teachings of Wright, and with regard to claim 6, further in view of Colley. Wright or Colley, however, fails to cure the deficiencies identified above in Hasselmark. Accordingly, claims 3-7 are patentable over Hasselmark, Wright, or Colley, singularly or in combination thereof for at least this reason.

Moreover, Applicant respectfully notes that, under 35 U.S.C. §103(c), the reference to Wright, which, based upon its filing date, could qualify as prior art under 35 U.S.C. §102(e), is not to be considered when determining whether an invention sought to be patented is obvious under 35 U.S.C. §103 because the subject matter of Wright and the claimed invention were commonly owned at the time the invention was made. *See*, MPEP §2146. Accordingly, claims 3-7 are patentable.

Further, despite the deficiencies in Hasselmark, the Office Action asserts that the method of claims 8 and 9, respectively, is rendered obvious by Hasselmark in view of the teachings of JP4-4776. In particular, the Office Action recognizes that Hasselmark does not disclose thermal correction of the applied flux, and proposes to cure this deficiency by modifying Hasselmark in view of the teachings of JP4-4776. However, Applicant respectfully submits that a *prima facie* case of obviousness has not been made because the Office Action fails to show all claim limitations by the proposed combination of Hasselmark and JP4-4776. As shown in Fig. 1 of JP4-4776, JP4-4776 apparently adjusts a voltage of the power supply 31 based on an output from a temperature detecting circuit 51 by relying on a temperature sensitive element 4 (i.e., a temperature sensor) and fails to teach or suggest applying the amount of magnetic flux and correcting for thermal variations based on the amount of measured flux, as recited in claims 8 and 9. Thus, at most, the proposed combination of Hasselmark and JP4-4776 would provide for a temperature sensor in the coil 62 of Hasselmark, which is distinctly different from the claimed invention as a whole which does not rely on a temperature sensor. And as noted in MPEP § 2143.03, "*[a]ll claim limitations must be taught or suggested by the prior art.*" Accordingly, claims 8 and 9 are patentable over the Hasselmark or JP4-4776, singularly or in combination thereof.

With regard to claims 15-17, Applicant respectfully notes that claims 15-17 have been canceled without prejudice or disclaimer, thereby rendering this rejection to claims 15-17 moot.

New claim 18 has been added to more particularly and distinctly claim the invention. In particular, claim 18 recites a method of controlling a magnetostrictive actuator that includes measuring a flux set point at a predetermined current level of the coil; detecting the amount of

change in magnetic flux as compared to the flux set point; and applying the amount of change in detected magnetic flux to the driver as a feedback variable to control the magnetizing force. Support for new claim 18 is provided in the originally filed specification at, for example, paragraphs 0027, 0031 and Figure 2.

Hasselmark, in contrast, relies on sensing a magnetic flux density of a magnetostrictive member to determine displacement of the magnetostrictive member, and fails to teach or suggest detecting a change in magnetic flux as compared to the flux set point, as recited in claim 18 along with other features of the claimed invention as a whole. Accordingly, claim 18 is also in condition for allowance.

CONCLUSION

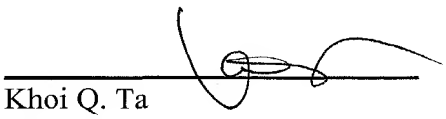
In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration and reexamination of this application and allowance of the pending claims 1-14 and 18. Applicants respectfully invite the Examiner to contact the undersigned at (202) 739-5203 if there are any outstanding issues that can be resolved via a telephone conference.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached pages are captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**"

EXCEPT for issue fees payable under 37 C.F.R. §1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0310. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. §1.136(a)(3).

Respectfully submitted,

MORGAN, LEWIS & BOCKIUS LLP



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VERSION SHOWING MARKED UP CHANGES

IN THE SPECIFICATION:

Paragraph 0026 has been amended as follows:

--[0026] Flux can be measured by using any of a number of methods. For example, a Hall-effect sensor 10, Giant Magnetoresistive (GMR) sensor 20, or eddy current sensor 30 may be used. Alternatively, the drive coil (or a sense coil) may be used to sense the time derivative of the flux, $d\phi/dt$, or a parametric measurement method of determining rate of change of flux may be used, such as is taught in U.S. Patent Number 5,991,143, "Method for Controlling Velocity of an Armature of an Electromagnetic Actuator," by Wright and Czimmek, which is hereby incorporated in its entirety by reference.--

IN THE CLAIMS:

New claim 18 has been added.

Claim 10 has been amended as follows:

10. (Amended) A method of controlling a magnetostrictive actuator, the method comprising:

energizing a coil with a current to generate magnetic flux within the coil;

measuring the amount of magnetic flux generated in the coil; and

applying the amount of magnetic flux generated in the coil as a feedback variable to selectively control the amount of magnetizing force applied to the magnetostrictive member located within the coil, and includes correcting for thermal variations, the correcting for thermal variations includes adding a thermal correction factor to a first setpoint level to generate a second setpoint level, wherein the thermal correction factor is determined based on resistance of the coil.

VERSION SHOWING MARKED UP CHANGES

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